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INFORMATION REPORT

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COUNTRY
Hungary/Czechoslovakia/Rumania

SUBJECT
Research Development Project on High Stability Oscillator and Signal Generator

25X1

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SUPPLEMENT TO REPORT

THIS IS UNEVALUATED INFORMATION

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General

1. a research and development project which dealt with high stability oscillators and high stability signal generators. The ultimate purpose of this project was to supply Hungary, and other satellite countries, with wide band transmitters with high stability tuning oscillaters, as well as high stability signal generators. Oscillators were a primary problem in the Air Force's 1 KW transmitters (R-50), although the Army had prime responsibility over the project.

Objectives

2. The objectives of this research project were as follows:

(a) To develop oscillators with a stability value $\left(\frac{\Delta F}{F}\right)$ of 10^{-6}, tunable to any frequency from 200 KC/s to 30 MC/s. This particular objective was primarily directed toward the improvement of the Air Force's 1 KW transmitter.

(b) The equipment should be frequency modulated for narrow band telegraph.

(c) The readings of the frequencies of the oscillator should follow the decimal system.

(d) The operating readiness should not exceed one minute. The application of advance or preheating was excluded from this time limit of one minute. The range of climatic temperatures under which the equipment was to operate were set at from minus 10°C to 60°C.

(e) The transmitter should have the following action capacity:

(1) [illegible] interrupted carrier frequency telegraph

(2) [illegible] modulated telegraph

DISTRIBUTION | STATE | ARMY | [illegible] | AIR

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(3) A_3 - voice transmittal

(4) F_1 - narrow band frequency modulation.

Solution

3. It was impossible with the materials available in Hungary to achieve a stability value of 10^{-6}. The maximum stability value that was attained was 5×10^{-6}, but this did not include the return accuracy to the starting point.

4. The oscillator was tunable from 1 MC to 5 MC so that it could be used directly on the 1 KW transmitters. (Above 5 MC the oscillator caused frequency multiplication in the transmitter.) From 200 KC to 1 MC, through multiplication of the 100 KC quartz frequency, we attained a 1 MC frequency, and, by blending, we produced the desired frequency between 200 KC and 1 MC. (Above 5 MC, frequency multiplication is always applied.)

5. Frequency modulation from 8 c/s to 1000 c/s could be set on the tunable oscillator. With the aid of a high speed relay an excellent frequency modulation could be attained despite the mechanical solution.

6. The tuning frequency value of the oscillator was in MC, 100 KC, 10 KC, and was in full decimal values in case of dial-tuned transmission.

7. The tubes of the oscillator could be preheated by battery. In this manner the operating readiness was less than 30 seconds, providing the thermostat was at normal heat. Following the turn-on time, the stability of the thermostat was plus or minus .1°C after one hour, and not more than plus or minus 3°C after 15 minutes. The tunable oscillator could be verified to the quartz oscillator.

8. The above described modulations could be made as follows:

(a) A_1 - at the ultimate point of the oscillator

(b) A_2, A_3 - possibly in the transmitter

(c) F_1 - as described in paragraph 5 above.

9. The verification of the tunable oscillator was attained by the simultaneous beating of the 200 KC and the 100 KC (quartz oscillator).

10. The Army, who had prime cognizance over this project, had the following objectives in mind when they initiated this program:

(a) To replace by late 1957 the oscillators of transmitters at all the larger airfields in Hungary. This was to be arranged through the production of 10 experimental units.

(b) If this proved successful, the Army was going to arrange for the further production of 150 more units for installation at all airfields and on other important military transmitters.

(c) In the years to follow, it was planned that they would produce a sufficient supply for other satellite countries, especially Czechoslovakia and Rumania.

11. [redacted] 25X1 preliminary models:

(a) a wood model [sic]. [redacted] note: A wood model is believed to refer to a basic laboratory research model. 25X1

(b) an experimental model

(c) a production or prototype model.

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[redacted]

Manufacturing Sites

12. [redacted] the wood model, the experimental model, and the partially completed production model were made at the Armed Forces Technical Institute, Budapest. The cost of this project, including the cost of the three basic models, was 180 thousand forints. [redacted] only 150 thousand forints had been originally granted for this purpose and came from the Ministry of Defense (Signal Corps) as a special grant. 25X1 25X1

13. The manufacture of the first 10 production models was to be assigned to and tooled by EMV (Electromechanikai Vallalat), Alberta ut, Budapest XI; however, this program was never started. EMV was selected as the initial producing firm because they had considerably more engineering experience than Belosmise (Standard), who was to mass produce the units once EMV had perfected the model.

14. EMV had estimated that the first 10 models would cost 30 thousand forints each. This included the cost of the tooling. Belosmise, on the basis of preliminary cost accounting, estimated that the cost of the units in mass production would be between five thousand and eight thousand forints. Belosmise based their cost estimate on (1) obtaining the tooling free of charge from EMV and (2) that there would be a minimum of one thousand units manufactured.

Foreign Marketing Possibilities

15. [redacted] if the results of the experimental production exceeded the 5×10^{-0} value, Czechoslovakia would place an order for two thousand units to be delivered within five years and payable in military equipment. If the results were not up to standard, then the Czech order was to call for only one thousand units. 25X1

16. Negotiations with Rumania were under way at the time [October 1956], as well as with the USSR and several other satellite countries [redacted] 25X1

[redacted]

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